

Official

RECEIVED  
3-25-03

72

IN THE CLAIMS

A clean version of the entire set of pending claims, including claim 26, is as follows:

1. (Twice Amended) A method in a data processing system for performing a raster operation of graphics data, wherein the data processing system includes a system memory and a video memory, wherein the system memory and the video memory are connected by a bus and wherein the graphics data is organized into picture elements, the method comprising the data processing system implemented steps of:

selecting a first plurality of picture elements from the system memory;

selecting a second plurality of picture elements from the video memory,

wherein the first plurality of picture elements and the second plurality of picture elements are selected such that changes in a direction of data on the bus are minimized when performing raster operations on the first plurality of picture elements and the second plurality of picture elements;

reading the first plurality of picture elements from the system memory;

reading the second plurality of picture elements from the video memory;

performing a raster operation on a picture element from the first plurality of picture elements and a picture element from the second plurality of picture elements to form a processed picture element;

writing the processed picture element to the video memory; and

repeating the performing and writing steps for each picture element in the first plurality of picture elements and the second plurality of picture elements until all picture elements have been processed, wherein changes in the direction of data on the bus are minimized between the reading and writing of picture elements.

2. The method of claim 1, wherein the plurality of processed picture elements form a scan line.

3. The method of claim 1, wherein the raster operation performs a logic OR function using a picture element from the system memory and a picture element from the video memory.

4. The method of claim 1, wherein the first plurality of picture elements are part of a source bitmap.

5. The method of claim 1, wherein the second plurality of picture elements are part of a destination bitmap.

6. The method of claim 1, wherein the reading steps, the performing step, and the writing step are performed in a graphics engine.

11. (Once Amended) A method for performing raster operations in a graphics system, wherein the method comprises the data processing system implemented steps of:  
collecting memory accesses of video data into batches of input operations and output operations for each line; and  
sending each batch of operations on a video bus in a single operation, wherein delays encountered by waiting for the video bus to change directions is minimized.

12. (Twice Amended) A data processing system comprising:  
a bus;  
a system memory connected the bus, wherein a first plurality of graphics elements are located within the system memory;  
a video memory connected to the bus, wherein a second plurality of graphics elements are located within the video memory;  
a processor unit connected to the bus, wherein the processor unit executes instructions to select a first plurality of picture elements from the system memory; select a second plurality of picture elements from the video memory in which the first plurality of picture elements and the second plurality of picture elements are

500017  
C3

selected such that changes in a direction of data on the bus are minimized when performing raster operations on the first plurality of picture elements and the second plurality of picture elements; read the first plurality of picture elements from the system memory; read the second plurality of picture elements from the video memory; perform a raster operation on a picture element from the first plurality of picture elements and a picture element from the second plurality of picture elements to form a processed picture element; write the processed picture element to the video memory; and repeat performing and writing for each picture element in the first plurality of picture elements and the second plurality of picture elements until all picture elements have been processed, in which changes in the direction of data on the bus are minimized between the reading and writing of picture elements.

---

13. The data processing system of claim 12, wherein the first plurality of graphics elements is a plurality of picture elements.
14. The data processing system of claim 12, wherein the first plurality of graphics elements form a scan line.
15. The data processing system of claim 12, wherein the scan line is a scan line in a bitmap.
16. The data processing system of claim 13, wherein the first plurality of picture elements form a bitmap.
17. The data processing system of claim 12, wherein a graphics engine performs the raster operation.
18. The data processing system of claim 12, wherein a video driver performs the raster operation.

19. (Twice Amended) A data processing system for performing a raster operation of graphics data, wherein the data processing system includes a system memory and a video memory, wherein the system memory and the video memory are connected by a bus and wherein the graphics data is organized into picture elements, the data processing system comprising:

first selecting means for selecting a first plurality of picture elements from the system memory;

second selecting means for selecting a second plurality of picture elements from the video memory, wherein the first plurality of picture elements and the second plurality of picture elements are selected such that changes in a direction of data on the bus are minimized when performing raster operations on the first plurality of picture elements and the second plurality of picture elements;

reading means for reading the first plurality of picture elements from the system memory;

reading means for reading the second plurality of picture elements from the video memory;

performing means for performing a raster operation on a picture element in the first plurality of picture elements and a picture element in the second plurality of picture elements to form a processed picture element;

writing means for writing the plurality of processed picture elements to the video memory; and

repeating initiate of the performing means and writing means for each picture element in the first plurality of picture elements and the second plurality of picture element until all picture elements have been processed, wherein changes in the direction of data on the bus are minimized between the reading and writing of picture elements.

20. The data processing system of claim 19, wherein the plurality of processed picture elements form a scan line.

21. The data processing system of claim 19, wherein the raster operation performs a logic OR function using a picture element from the system memory and a picture element from the video memory.

22. The data processing system of claim 19, wherein the first plurality of picture elements are part of a source bitmap.

23. The data processing system of claim 19, wherein the second plurality of picture elements are part of a destination bitmap.

24. The data processing system of claim 19, wherein the first reading means, the second reading means, the performing means, and the writing means are located in a graphics engine in the data processing system.

25. (Once Amended) A data processing system for performing raster operations in a graphics system, wherein the data processing system comprises:

collecting means for collecting memory accesses of video data into batches of input operations substantially equal to a number of rasters in a video display; and

sending means for sending each batch of input operations on a video bus in a single operation, wherein delays encountered in waiting for the video bus to change directions is minimized.

26. (Once Amended) The data processing system of claim 25 further comprising:

collecting means for collecting memory accessed of video into batches of output operations substantially equal to a number of rasters in a video display; and

sending means for sending each batch of output operations on a video bus in a single operation.

27. (Once Amended) The data processing system of claim 25, wherein the batches of input operations are sent to a system memory connected to a video bus.

28. The data processing system of claim 25, wherein the batches of output operations are sent to a video memory connected to a video bus.

29. A data processing system for performing raster operations in a graphics system, wherein the data processing system comprises:

collecting means for collecting video accesses into batches of input operations and output operations for each line; and

sending means for sending each batch of output operations on a video bus in a single operation, wherein delays encountered by waiting for the video bus to change directions is minimized.

30. (Twice Amended) A computer program product in a computer readable medium for performing a raster operation of graphics data, wherein the data processing system includes a system memory and a video memory, wherein the system memory and the video memory are connected by a bus and wherein the graphics data is organized into picture elements, the computer program product comprising:

first instructions for selecting a first plurality of picture elements from the system memory;

second instructions for selecting a second plurality of picture elements from the video memory, wherein the first plurality of picture elements and the second plurality of picture elements are selected such that changes in a direction of data on the bus are minimized when performing raster operations on the first plurality of picture elements and the second plurality of picture elements;

third instructions for reading the first of a first plurality of picture elements from the system memory;

fourth instructions for reading the second plurality of picture elements from the video memory;

fifth instructions for performing a raster operation on a picture element in the first plurality of picture elements and a picture element in the second plurality of picture elements to form a processed picture element;